Ashutosh Panigrahy

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Education

Duration	Degree	Course/Board	Institute	Performance
2024 – 2025	M.Tech	Financial Engg	Indian Institute of Technology Kharagpur	8.53/10
2020 – 2024	B.Tech	Biotechnology	Indian Institute of Technology Kharagpur	8.58/10
2019 – 2020	Grade XII	CBSE (STEM)	Sai International School, Bhubaneswar	98.4/100
2017 – 2018	Grade X	CBSE	Sai International School, Bhubaneswar	97.0/100

Projects

MemAlloc **Jun 26 – Jul 26**

Objective: Custom C memory allocators for memory management using contiguous arena and stack-based strategies

- Implemented custom **arena** and **double-ended stack allocators** in C, managing contiguous memory regions through explicit allocation, deallocation, reset, and reuse operations for predictable, low-overhead memory management.
- Built low-level memory-management primitives for **alignment**, allocation boundaries, capacity tracking, and bidirectional stack growth, with tests covering memory exhaustion, reset behavior, and reuse across lifecycles

Benchlite **May 26 – Jun 26**

Objective: Header-only C++20 micro-benchmarking framework for cycle-accurate telemetry with an experiment-driven API

- Quantified up to **10.7% p99** latency reduction via vector pre-allocation and measured up to a **4.3**× lower p99 latency for **std::vector** over **std::list** under large cache footprints, using **thread affinity** and elevated priority on AMD x86_64.
- Developed a **header-only** C++20 profiling library with an experiment-driven API, utilizing the **rdtsc** hardware instruction (**std::chrono** fallback) to capture and export cycle-accurate telemetry to CSV files for offline analysis.

Xchange **Apr 25 – Jul 25**

Objective: Exchange-style C++ order matching engine with multi-symbol support, 10 order types, and strict price-time priority

- Engineered a multi-symbol order matching engine supporting multiple participants, **10 order types** with strict **price-time priority**, enabling realistic exchange-style order execution, cancellation, modification, and partial fills
- Implemented O(1) order lookup with **std::unordered_map**, price-ordered bid/ask levels with **std::map** and custom comparators, and FIFO time priority with **std::list**; validated the engine with **GTest** and **Make** as the project build tool

Work Experience

Technical Consultant (Backend SWE) | TCG Digital **Aug 25 – Nov 26**

Objective: Build and operate reliable, low-latency pipelines for real-time media processing and AI-powered content delivery

- Achieved a **6 second** end-to-end latency on a **zero-downtime** live video-streaming platform with AI translation powering localized Hindi HLS/SRT feeds for **4** Indian national-broadcasters across **360+** hours of German football
- Architected a **Docker**-based microservices system with **Kafka** for distributed messaging, **Redis** for in-memory state management, and **FFmpeg** for real-time video/audio processing, supporting high-throughput live streams.

Data Science Intern | Manipal Fintech **May 24 – Jul 24**

Objective: Develop data-driven strategies to identify repeating customers and integrate them into operational processes

- Engineered an **XGBoost** predictive model utilizing **SMOTE** to achieve a **0.93** F1-score (**24**% above RF baseline), and deployed a **Plotly** dashboard leveraging RFM and CLV segmentation to enhance customer retention tracking.
- Automated data pipeline that reduced processing time by **80**% and captured **50**% more errors through enhanced validity checks, integrated with a Streamlit application for loan quoting that saved **5+** hours/week in manual effort.

Miscellanies

- **Competitions:** Akuna Challenge'24 (Finals) | IMC Prosperity'25,'23 (Top **3%**) | Citadel Datathon'23 (APAC Top **20**)
- **Exams:** JEE Advanced'20 (Top **3%**) | JEE Mains'20 (Top **0.01%**) | XII CBSE Science Boards'20 (All State Rank **2**)
- **Skills:** C++20 | C | Python3 | Linux | GDB | Git | Godbolt | GTest | Wireshark | Kafka | Redis | Docker | MariaDB
- **Courses:** Linear Algebra | Probability & Statistics | Calculus | Time Series | RL | Derivatives & Risk Management